

figures of transverse sections of stomata show that any noticeable widening of the slit in the ordinary way is impossible, because of the very thick cell walls. The guard cell, however, can move a little as a whole, because it is distinctly hinged with the adjacent cell. The general conclusions reached are as follows: a movement as described by SCHWENDENER for grass stomata is impossible; the guard cells can vary their distance from each other to a slight extent by changing their position among the surrounding epidermal cells; the position and structure of the neighboring cells makes it possible to change the length of the slit in the vertical direction.—J. M. C.

**Internal temperatures of plants.**—PEARSON<sup>15</sup> has made observations on internal temperatures of the stems of *Euphorbia virosa* and *Aloe dichotoma* at 4200 ft. altitude, on the western flanks of the great Karasberg Range in Great Namaqualand. *Euphorbia* reached its maximum at about 2:00 P.M., about the same hour as the shade maximum; while *Aloe* attained its maximum after sundown. In *Euphorbia* the highest internal temperature observed was 51°5 C.; the greatest range of internal temperature was 27°5 C.; and the excess of internal over shade temperature 15°35 C., as against 38°5, 16° C., and 5° C. respectively for *Aloe*. These observations were made in December. It is likely that in February and March both the internal maximum temperature and the excess over shade temperature is much greater. Xerophytes have much reduced transpiration, the greater of the two cooling methods in mesophytes, and depend largely upon thermal emissivity for cooling. Even in mesophytes as great difference between shade and internal leaf temperatures have been observed as are recorded here, and in xerophytes much greater differences. The author observes that wounding *Euphorbia* causes a considerable fall in the internal temperature. This is due partly to expansion of gases in the air chambers and partly to rapid evaporation from the wound.—WILLIAM CROCKER.

**Javanese Pallavicinias.**—CAMPBELL and Miss WILLIAMS<sup>16</sup> have recently completed a study of three species of *Pallavicinia* collected by Professor CAMPBELL in Java in 1906. The apical cell in the three species is dolabrate, being similar to the usual condition in *P. Lyellii*, which, however, the reviewer has observed rarely has a triangular pyramidal cell similar to the one in *P. decipiens*. The antheridium in development shows the usual situation among Jungermanniales. A delicate wall separates the pairs of spermatocytes. No "Nebenkörper," reported by IKENO for *Marchantia*, was found. The archeogonia present few variations from the usual liverwort conditions. In *P.*

<sup>15</sup> PEARSON, H. H. W., Observations on the internal temperatures of *Euphorbia virosa* and *Aloe dichotoma*. *Annals Bolus Herb.* 1:41-66. 1914.

<sup>16</sup> CAMPBELL, D. H., and WILLIAMS, FLORENCE, A morphological study of some members of the genus *Pallavicinia*. *Leland Stanford Jr. Univ. Pub.* 7, Univ. Series, pp. 44. *figs.* 23. 1914.